



Imaging

COMPARATIVE ACCURACY OF POSITRON EMISSION TOMOGRAPHY AND SINGLE-PHOTON EMISSION COMPUTED TOMOGRAPHY FOR THE DIAGNOSIS OF CORONARY ARTERY DISEASE: A META-ANALYSIS

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Saturday, March 24, 2012, 11:00 a.m.-Noon

Session Title: Protocol Update in Nuclear Imaging

Abstract Category: 23. Imaging: Nuclear

Presentation Number: 1106-349

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Background: Positron emission tomography (PET) myocardial perfusion imaging (MPI) offers technical benefits over single-photon emission computed tomography (SPECT) MPI, but there has been no systematic evaluation of their comparative diagnostic accuracy.

Objective: To compare the sensitivity and specificity of PET versus SPECT MPI for $\geq 50\%$ stenosis of any epicardial coronary artery in patients with known or suspected coronary artery disease (CAD) using meta-analysis of the published literature.

Methods: We conducted a systematic review of prospective, English-language studies evaluating the sensitivity and specificity of PET and/or SPECT MPI. Two investigators independently searched MEDLINE and EMBASE from inception through March 2011 and manually reviewed references of identified studies. Included studies performed coronary angiography in all evaluable patients and reported sufficient data to calculate true and false positives and negatives.

Results: Nine PET and 117 SPECT studies, with 650 and 11,362 patients respectively, were included. Bivariate meta-analysis demonstrated a significantly higher pooled mean sensitivity with PET [93% (95% Confidence Interval (CI), 88% to 95%)] compared to SPECT [88% (95% CI, 86% to 90%)] ($p=0.04$). No significant difference in specificity was observed between PET [81% (95% CI, 67% - 90%)] and SPECT [76% (95% CI, 72% - 79%)] ($p=0.39$) (Figure).

Conclusions: In a meta-analysis of 12,012 patients, PET MPI had a higher sensitivity for CAD than SPECT MPI.

Figure. Summary Receiver Operator Curves for PET and SPECT Myocardial Perfusion Imaging

